

A Comprehensive Economic Analysis of Tobacco Farming Potential in Grobogan Regency, Central Java

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This study aims to investigate the planning for the Tobacco Products Industrial Area (KIHT) development in Grobogan Regency, Central Java, based on economic analysis. KIHT is an area where the activities of the tobacco products industry are concentrated, equipped with infrastructure, facilities, and supporting facilities for the tobacco products industry. The study was designed with a survey approach, in-depth interview, and focus group discussion (FGD) with 100 key informants to obtain facts from the existing phenomena and find information factually. The number of key informants is based on the number all of tobacco numbers in Grobogan regency. The study, therefore, analyzes tobacco competitiveness, labor absorption, product market, and macroeconomic analysis. To sharpen the analysis, the study was supported with a questionnaire instrument to see how far tobacco farmers were prepared in KIHT development. Empirically, the results showed that tobacco farming absorbed 150 HOK/ha per season, greater than corn farming which only absorbed 52 HOK per season per ha and rice farming which absorbed 87 HOK per season per ha. It had high competitiveness with the oligopsony market structure. In addition, the market for tobacco products was experiencing a significant upward trend, and it is in accordance with the Cobweb Theorem law that the behavior of farmers will try to increase the planting area when there is a previous price increase. From the potential of tobacco products, Grobogan Regency received an excise duty of IDR 14.87 billion or 2% of the total excise duty of Central Java Province. This revenue-sharing fund will increase the regional fiscal capacity.

Keywords: Tobacco, KIHT, Economic Analysis, Grobogan Regency, Economic Analysis, Survey Approach, Tobacco Competitiveness, Cobweb Theorem, Excise Duty.

INTRODUCTION

The use of tobacco leaves extends beyond traditional cigarette manufacturing, and there is a growing interest in developing alternative products that harness the potential health benefits of tobacco. One notable avenue of exploration is the development of nicotine replacement therapies (NRTs). Nicotine, the primary addictive component in tobacco, has been separated from harmful tobacco combustion products and formulated into various NRTs, such as nicotine patches, gum, lozenges, and inhalers (Stead *et al.*, 2012). These products aim to assist individuals in quitting smoking by providing a controlled and safer alternative to the harmful effects of traditional smoking.

In another pattern of manufacturing for tobacco leaves, cigarettes are a commodity widely consumed by Indonesian people, even the negative externalities it causes, but its popularity is hard to decline. stated that the increasing number of people with cancer and/or other diseases is caused

by smoking, so it is quite relevant if the government uses excise duty as an instrument to control cigarette consumption. In Indonesia, the mortality cases of cigarette smokers every year is in order of 217,000 and 240,000 people . The justification for the imposition of excise on cigarettes to control consumption also refers to the Task Force on Community Preventive Services (2000), which states that cigarette excise is one of the most effective strategies to reduce cigarette consumption. In other words, the high tax/excise duty on cigarettes is associated with a decrease in consumption. However, excise duty on cigarettes has no significant effect on demand for cigarettes, so the use of fiscal instruments (excise/tax) to control cigarette consumption is not effective enough. Instead, high tax/excise rates provide greater incentives for business actors and/or consumers to avoid taxes. In addition, various campaigns to reduce cigarette consumption continue to be promoted by various groups, non-governmental organizations (NGO), and the government through various forms of production,

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distribution, and marketing policies (von Lampe & Kurti, 2016). In addition, various campaigns to reduce cigarette consumption continue to be promoted by various groups, non-governmental organizations (NGO), and the government through various forms of production, distribution, and marketing policies.

Moreover, it must be acknowledged that in addition to the negative impact, the cigarette industry also contributes significantly to government revenues in particular and the economy in general, both nationally and regionally at the production site. Various forms of state levies have also been imposed on tobacco products in the form of excise duty, value-added tax, and cigarette tax so that cigarettes become expensive and reduced their consumption, but using the usual multi-layered excise tariff structure even has an impact on increasing government revenues. However, from a microeconomic point of view, cigarettes are a commodity whose demand level tends to be inelastic or even perfectly elastic so that price increases do not affect people's tendency to consume cigarettes (Henderson, 2022).

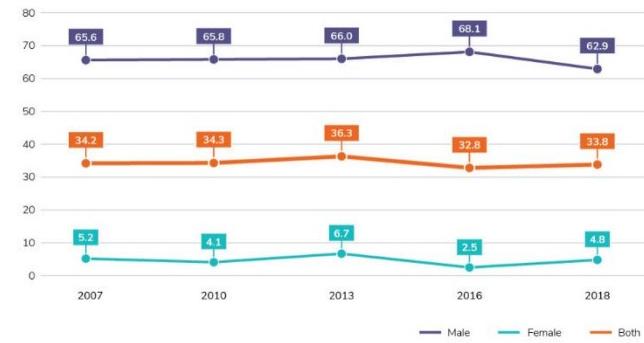
Additionally, the field of medical research is exploring the potential of tobacco leaves for therapeutic purposes. Recent studies have focused on harnessing the anti-inflammatory properties of tobacco-derived compounds. Researchers have identified specific proteins and peptides in tobacco plants that exhibit anti-inflammatory effects and may hold promise for the development of medications to treat inflammatory conditions (Azizi et al., 2023). This avenue of research represents a departure from the conventional use of tobacco and highlights its potential as a source of beneficial compounds.

Another innovative application of tobacco leaves is in the production of plant-based vaccines. This biotechnological approach involves utilizing genetically modified tobacco plants to produce specific antigens for vaccines. Research has demonstrated the feasibility of using tobacco leaves to produce vaccines against infectious diseases, offering a cost-effective and scalable alternative to traditional vaccine production methods. This application showcases the versatility of tobacco plants in contributing to advancements in medical science and global health. This application showcases the versatility of tobacco plants in contributing to advancements in medical science and global health.

Furthermore, the cultivation of low-nicotine or nicotine-free tobacco varieties has gained attention as an avenue to minimize the addictive potential of tobacco products. These varieties can be utilized in the production of smoking alternatives or recreational products with reduced harm potential, providing consumers with options that are less detrimental to their health (Denic et al., 2022).

Indonesia, with the 4th largest population in the world, has 60.8 million (62.9%) adult male smokers, and 3.7 million (4.8%) adult female smokers. Cigarette consumption for men shows a high upward trend, in fact, based on surveys, almost

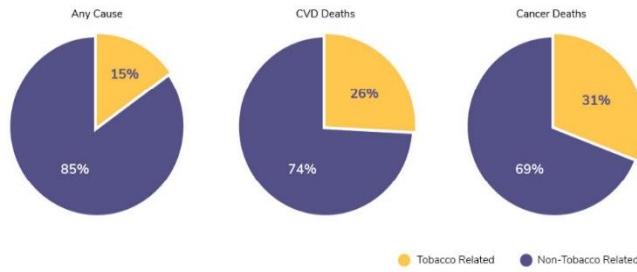
every two out of three adult men smoke (fig.1). Statistics place Indonesia among the countries with the highest levels of cigarette consumption in the world.



Source: World Health Organization-South East Asia, 2020

Figure 1. Prevalence (%) of current tobacco use among adults (15 years and above), 2007–2018.

The Global Burden of Disease (GBD) estimates from Indonesia suggest that tobacco use remains one of the most important risk factors causing premature death disability. Cardiovascular Diseases (CVDs) are the number one cause of death and premature death in Indonesia (Heriyani et al., 2013), causing an estimated 558,736 deaths each year about 36.3% of all death. A significant proportion of cancer and CVDs related death in Indonesia can be attributed to tobacco use (fig. 2) A significant proportion of cancer and CVDs related death in Indonesia can be attributed to tobacco use (fig. 2)



Source: World Health Organization-South East Asia, 2020

Figure 2. Contribution of tobacco use to deaths due to major chronic diseases in Indonesia

The economic costs of tobacco consumption are not only health service costs, but also non-health costs, including disability costs and death costs. Meilisa et al., (2022) claim that health service costs due to consuming cigarettes amounted to approximately IDR 17.9-27.7 trillion in 2019 or 0.2% of Indonesia's GDP. Tobacco consumption does have an impact on various diseases experienced by society, but on the other hand, tobacco excise is also a potential source of government revenue. The Indonesian government's revenues in the APBN originating from tobacco excise in 2018 reached around IDR 164.8 billion. The government increased tobacco



excise by 23% in 2020 with the aim of not only reducing cigarette consumption but also increasing government revenue. Tobacco consumption does have an impact on various diseases experienced by society, but on the other hand, tobacco excise is also a potential source of government revenue. The Indonesian government's revenues in the APBN originating from tobacco excise in 2018 reached around IDR 164.8 billion. The government increased tobacco excise by 23% in 2020 with the aim of not only reducing cigarette consumption but also increasing government revenue ([Nurhayati-Wolff, 2021](#)).

Historically, tobacco has received great attention as a high-value commodity since the Dutch East Indies colonial government. In its development, tobacco plants were widely cultivated by smallholder farmers in Java, especially in Central Java and East Java, while outside Java, it was developed in Sumatra and South Sulawesi ([Susanto, 2012](#)). Specifically, Grobogan Regency is one of the areas with a large potential for tobacco commodities and contributes significantly to farmers' incomes and the regional economy, with 14 quite good tobacco-producing sub-districts. The production level reached 4,563.84 tons, and the average productivity arrived at 1.52 tons/hectare. In the 2021 period, the planted area was 3,106.16 ha. Compared with the total area of plantation commodities in Grobogan Regency of 6,925.38 ha, the share of the tobacco planting area was 43.44%. In addition, dry chopped tobacco production also increased from 2016 to 2020, from 1,198 tons to 4,565 tons. Thus, the average production of dry chopped tobacco was 3,298 tons per year ([BPS-Statistics Grobogan Regency, 2022](#)). Grobogan Regency is a district that is geographically located in the eastern part and is in the middle lane of Central Java Province, located between 110°15' East Longitude - 111°25' East Longitude and 7° South Latitude - 7°30' South Latitude. With an area of approximately 1,975.86 km², stretching from west to east for + 83 km and from north to south + 37 km. Grobogan Regency, whose capital is Purwodadi, is the 2nd largest district in Central Java Province ([BPS-Statistics Grobogan Regency, 2022](#)).

Tobacco farmers can produce dry tobacco of 1.84-2 tons per hectare, and they can get an income of IDR 56 million with a tobacco price of IDR 15,000-19,500/kg. In the dry season, farmers can produce tobacco of better quality so that farmers can get dry tobacco prices of IDR 26,000/kg. It means that farmers will get IDR 65 million/ha. With a total operational cost during the growing season to post-harvest of IDR 36.5 million/hectare, farmers are still profitable even at the lowest dry tobacco price (FGD, 2021). Therefore, tobacco leaves could be processed as an input for several products and decrease the possibility to increase the growth of cigarette manufacturers, which can cause negative externalities for public health.

With this data, being a tobacco farmer is never a loss. Furthermore, since there are partner companies as collectors

who cooperate with big cigarette factories in Indonesia, farmers do not feel worried that their tobacco products will not be absorbed in the market. It is a good opportunity for tobacco farmers to survive in their activities and even create new tobacco farmers in Grobogan Regency.

From this phenomenon, this study attempts to conduct an economic analysis related to the KIHT development planning in Grobogan Regency to increase the welfare of tobacco farmers, enlarge the market for tobacco products, and reduce the production of illegal tobacco products. KIHT is an area where the activities of the tobacco products industry are concentrated, equipped with infrastructure, facilities, and supporting facilities for the tobacco products industry. Thus, it will have implications for improving the regional and the national economy. the regional and the national economy.

KIHT is also an embodiment of government concern to boost economic recovery and empower the small-medium industries. Besides that, KIHT aims to optimize the utilization of the Tobacco Products Excise Revenue Sharing Fund (DBH-CHT), simplifying the assistance and supervision and growing the supporting industries □HYPERLINK "bookmark://Regulation". There are several activities in KIHT, namely the management and development of KIHT conducted by the KIHT operator, tobacco production, tobacco packaging for retailers, excise stamp sticking conducted by tobacco factory operators inside KIHT, and other productions conducted by supporting operators inside KIHT. Furthermore, the establishment of KIHT aims to improve the compliance of excise operators as a non-repressive kind of supervision, thus decreasing the circulation of illegal tobacco and creating a multiplier effect to grow the local economy. Other purposes are to improve the competitiveness of small-medium tobacco industries, utilize the Tobacco Products Excise Revenue Sharing Fund more effectively and efficiently, and develop the regional economy by encouraging small-medium industries to support the tobacco industry KIHT ([Directorate General of Customs and Excise, 2020](#)).

"Smoking kills you" is written on cigarette packaging with a picture of smoke forming a skull. The aim is to protect public health and the environment from the dangers of addictive substances in tobacco products which can cause disease and death ([Kristina et al., 2019](#)). However, smokers still smoke even though we know that the use of cigarettes or tobacco products has negative externalities that impact not only the smoker but also the health of other people around the passive smoke ([Fauzi & Pongpanich, 2022](#)). To overcome this, the government has issued regulations, namely the imposition of excise on tobacco commodities, and is outlined in Law Number 39 of 2007 concerning Excise Tax ([Kamilina, 2022](#)). Smoking continues to be a significant public health challenge, and the negative externalities associated with tobacco use extend far beyond individual health concerns. One of the most pressing issues is the environmental impact of cigarette consumption. Discarded cigarette butts are a pervasive form



of litter, containing toxic chemicals that can leach into soil and water, posing threats to aquatic ecosystems and wildlife. The production and distribution of cigarettes contribute to deforestation and other environmental degradation, emphasizing the need for sustainable measures to control cigarette consumption and reduce its environmental footprint (Barnes *et al.*, 2023).

The economic burden of smoking-related healthcare costs remains substantial, with recent studies indicating persistent challenges. The costs associated with treating smoking-related illnesses place strain on healthcare systems globally. A study by Franzen & Cattano (2022) underscores the economic impact, estimating that smoking-related healthcare costs in the United States alone exceeded \$300 billion annually. These financial burdens underscore the importance of comprehensive tobacco control measures to alleviate the strain on healthcare systems and redirect resources towards preventive measures and public health promotion. underscores the economic impact, estimating that smoking-related healthcare costs in the United States alone exceeded \$300 billion annually. These financial burdens underscore the importance of comprehensive tobacco control measures to alleviate the strain on healthcare systems and redirect resources towards preventive measures and public health promotion.

The social costs of smoking reverberate through various facets of society, impacting both productivity and social well-being. Workplace absenteeism and decreased productivity due to smoking-related illnesses contribute to economic losses for employers and hinder overall societal progress. Moreover, the burden of caring for individuals with smoking-related health issues falls disproportionately on families and communities, exacerbating existing social disparities

(Drope *et al.*, 2018). Addressing these social externalities requires a holistic approach that includes not only individual behavior change but also broader policy measures to create smoke-free environments. . Addressing these social externalities requires a holistic approach that includes not only individual behavior change but also broader policy measures to create smoke-free environments.

Secondhand smoke exposure remains a critical health concern, particularly for non-smokers. Updated literature underscores the association between passive smoking and various health problems, including respiratory illnesses, cardiovascular diseases, and adverse effects on pregnancy outcomes (Kalkhoran & Grantz, 2018). Protecting non-smokers from the harmful effects of secondhand smoke necessitates stringent smoking bans in public spaces and workplaces. These measures not only contribute to individual health but also help mitigate the broader societal impact of passive smoking.. Protecting non-smokers from the harmful effects of secondhand smoke necessitates stringent smoking bans in public spaces and workplaces. These measures not

only contribute to individual health but also help mitigate the broader societal impact of passive smoking.

In conclusion, the negative externalities of smoking encompass environmental degradation, economic burdens, and social disparities. With recent literature emphasizing the ongoing challenges posed by smoking, comprehensive measures to control cigarette consumption are paramount. Policymakers must consider updated evidence to implement effective strategies, including increased taxation, marketing restrictions, and smoking cessation programs. By addressing the multifaceted consequences of smoking, society can work towards a healthier and more sustainable future. However, Grobogan regency has land quality which is match to the tobacco agriculture. The tobacco leaves are still needed in several productions and export to other countries. Therefore, improving the quality of tobacco farming potential in Grobogan regency, could improve the regency revenue in agriculture sector.

Research Methodology: In general, this study aims to determine the feasibility of Tobacco Products Industrial Area (KIHT) development in Grobogan Regency from an economic perspective as a guideline for local governments, the cigarette industry, tobacco farmers, and the people in the KIHT establishment. The study was designed with in-depth interview and focus group discussion (FGD) to obtain facts from the existing phenomena and find information factually. FGD participants consisted of representatives of tobacco farmers, cigarette industry, partner companies, Indonesian Tobacco Farmers Association (APTI), and 14 heads of sub-districts. Study locations were determined in 14 sub-districts as centers of tobacco production.

Since the number of tobacco farmers in Grobogan regency is limited to 100 farmers, therefore, all the farmers are collected as the key informants for this research. Data processing techniques for the production and productivity of tobacco farmers were analyzed from socio-economic environment, while the tobacco trade system was examined from the aspect of market performance and the competitiveness which determined by Porter's Diamond Theory. The Porter's Diamond Theory components consists of describing the factors condition element, demand condition element, elements of market structure, competition and tobacco farming strategy, elements of related and supporting industries and analysis of government policy factors and opportunities (Porter, 1992).

MATERIALS AND METHODS

Each study area is unique, so it is difficult to identify specific problems using existing theory. Starting from the basic assumptions and possibilities, the problem formulation was arranged in stages. The problem was, "How is KIHT as an area needed by Grobogan Regency people and able to develop properly?" This question is meant to (1) recognize how



Grobogan Regency spatially changes related to the development of time, (2) KIHT as its material object, (3) analysis stages, and (4) draft the KIHT development concept to answer the KIHT development's needs in Grobogan Regency.

This study used descriptive analysis of farmers' income and efficiency, markets and marketing, macroeconomics, labor absorption in the tobacco sector, tobacco farmers' welfare, and competitiveness analysis using Porter's Diamond Theory components. A macroeconomic study analyzed how KIHT would have a multiplier effect on people's welfare, increase regional fiscal capacity, and reduce unemployment in Grobogan Regency. The number of workers in the tobacco industry sector in the KIHT model was used as a "measured average as a measure of growth," whereas calculating the amount of employment in the tobacco industry sector utilized the employment elasticity.

Then, the analysis of farmer welfare used the market performance approach, measuring the efficiency of resource use and whether there were benefits from tobacco production activities, thus increasing the welfare of tobacco farmers. Market performance can be measured from the share of prices received by farmers (farmer's share). The portion of the price received is the ratio between the farmer's selling price and the retailer's consumer price. Meanwhile, the competitiveness of the tobacco industry was analyzed with Porter's Diamond approach by examining each component of Porter's Diamond Theory. These components are as follows:

- a) Factor Condition (FC) is the state of production factors in an industry, such as labor and infrastructure.

- b) Demand Condition (DC) is the state of demand for goods and services in the region.
- c) Market structure, competition, and strategy
- d) Related and Supporting Industries (RSI) is the state of suppliers' conditions and other mutually supportive and interconnected industries.

RESULTS AND DISCUSSION

KIHT is one of the efforts to restore the national economy through the empowerment of SMEs, which have the flexibility to face the pressures of the economic crisis and can move swiftly to revive the stalled economic engine due to declining aggregate demand and reduced global supply. KIHT was formed to support, develop, and improve the competitiveness of the tobacco products industry and is an integrated area for legal small-medium scale cigarette producers.

On the other side, it is known that the contribution of excise is still the mainstay in the state budget as a source of government revenue, and the contribution of excise was 9.3% of the total revenue. Tax revenue from industry in the 2020 state budget was IDR 326 trillion, with 61% or IDR 200 trillion coming from the tobacco or cigarette product industry. Thus, the development of KIHT will increase government revenues from this sector and become a source of financing for government expenditures. For local governments, the development of the tobacco products industry also influences the potential for increased revenue sharing from excise taxes, which will increase regional fiscal capacity.

Table 1. Excise Sharing for Central Java Province in 2021

No	Regencies	Total (IDR. 000)	No	Regencies	Total (IDR.000)
1	Central Java Province	223,038,100	19	Pekalongan Regency	6,611,446
2	Banjarnegara Regency	6,981,121	20	Pemalang Regency	7,254,105
3	Banyumas Regency	6,707,603	21	Purbalingga Regency	7,167,576
4	Batang Regency	7,350,175	22	Purworejo Regency	7,894,221
5	Blora Regency	10,001,162	23	Rembang Regency	25,269,511
6	Boyolali Regency	19,799,760	24	Semarang Regency	8,505,179
7	Brebes Regency	7,046,325	25	Sragen Regency	6,702,569
8	Cilacap Regency	6,723,773	26	Sukoharjo Regency	6,975,049
9	Demak Regency	19,298,745	27	Tegal Regency	7,284,405
10	Grobogan Regency	14,873,745	28	Temanggung Regency	32,243,677
11	Jepara Regency	7,509,595	29	Wonogiri Regency	11,460,396
12	Karanganyar Regency	14,157,256	30	Wonosobo Regency	12,126,569
13	Kebumen Regency	8,190,396	31	Magelang City	6,625,806
14	Kendal Regency	12,901,630	32	Pekalongan City	7,108,120
15	Klaten Regency	14,620,464	33	Salatiga City	7,113,878
16	Kudus Regency	155,532,486	34	Semarang City	8,727,067
17	Magelang Regency	14,421,301	35	Surakarta City	7,206,196
18	Pati Regency	11,470,980	36	Tegal City	6,559,945
Total Excise Sharing for Central Java Province					743,460,332

Source: Indonesia Directorate General of Customs and Excise, 2021



Potential of Tobacco Excise Revenue Sharing: As a tobacco producer, Grobogan Regency obtained excise revenue sharing from the central government. Of the total excise revenues in the state budget, 2% was distributed to excise-producing provinces. Of this amount, 30% was received by the province, 40% was for the excise-producing region, and the remaining 30% was distributed to all regions in the province. The following data illustrates the excise revenue sharing received by Grobogan Regency in 2021.

Based on this data, Grobogan Regency received an excise share of IDR 14.87 billion or 2% of the total excise share of Central Java Province. In this case, excise revenue sharing will continue to increase if cigarette production in Grobogan Regency also increases every year, so the tobacco production must be increased, either by adding the area for growing tobacco or by increasing the productivity of tobacco.

From the response of FGD, the participants stated that if farmers produced dry tobacco of 1.84-2 tons per hectare, they would get an income of IDR 56 million with a tobacco price of IDR 15.000-19500/kg. In the dry season, farmers could produce tobacco of better quality so that farmers could get dry tobacco prices of IDR 26.000/kg. It means that farmers would get IDR65 million rupiah/ha. With a total operational cost during the growing season to post-harvest of IDR 36.5 million/hectare, farmers are still profitable even at the lowest dry tobacco price. It can be concluded that being a tobacco farmer never loses, especially with partner companies as collectors who cooperate with large cigarette factories in Indonesia. Thus, farmers were not worried that their tobacco products would not be absorbed in the market. In other words, it is a good opportunity for tobacco farmers to stay in their activities as tobacco farmers and can even attract new tobacco farmers to Grobogan Regency.

Labor Absorption Potential: From the labor absorption, the agricultural sector plays an important role in the economy of Grobogan Regency and is the main contributor to the added value of the economy. The large contribution of the agricultural sector also indicates the large absorption of labor. In simple terms, employment means the amount of labor that the economic sector can absorb. While the labor absorption in the agricultural sector means the number of workers that the agricultural sector can absorb. In this case, the ability of tobacco farming to absorb labor in Grobogan Regency from planting to post-harvest was 150 HOK/ha. It means that tobacco farming could absorb a very large workforce. If the total area of tobacco plants in Grobogan County is 3,106.18 hectares, it will absorb a workforce of 465,927 people. The problem is how workers in the tobacco commodity sector can adopt new technologies quickly to increase their productivity. In Indonesia, the agricultural sector use HOK/ha as the unit analysis in all of agriculture farming product which identifies based on hectare. HOK is the unit analysis defining as hour of farmers work (*Hari Orang Kerja* in Bahasa Indonesia).

The high labor absorption in tobacco farming is due to the many stages of activities in tobacco farming, starting from seeding, land preparation, land processing, planting, maintenance, harvesting, and post-harvest. In addition, the amount of labor that tobacco farming activities can absorb is divided into two main activities: cultivation activities and agro-industrial activities (post-harvest). Compared with the labor absorption in the food crops sub-sector, the absorption of tobacco farming for workers is much greater. Corn farming only requires or absorbs labor of 52 HOK per season per Ha, while rice farming absorbs labor of 87 HOK per season per Ha.

Further, the open unemployment rate in Grobogan Regency in 2020 increased from the previous year, from 3.59% to 4.5%. This increase was due to the economic contraction in the same period due to the COVID-19 pandemic. Related to that, tobacco farming can be one of the efforts to reduce the unemployment rate because the agricultural sector is consistently a major contributor to the regional economy. Although the economic growth of Grobogan Regency contracted by -1.59% in 2020, the agricultural sector grew positively by 2.28%, with a contribution of 28.64% to the regional economy (see Table 2). Growth in the agricultural sector is expected to absorb labor sustainably, thus becoming an important factor in reducing poverty levels.

Table 2. Share and Growth of Economic Sectors in Grobogan Regency, 2020.

Sr. Economic Sector	2020	
	Share (%)	Growth (%)
1 Agriculture, forestry, fishing	28.64	2.28
2 Mining and quarrying	1.35	1.52
3 Manufacturing	13.7	0.39
4 Electricity and gas	0.09	5.65
5 Water supply, waste processing, waste and recycling	0.05	1.92
6 Construction	5.30	-8.23
7 Wholesale and retail, car, and motorcycle repair	19.91	-3.26
8 Transportation and storage	3.55	-28.62
9 Accommodation and food service activities	4.84	-1.60
10 Information and communication	3.06	16.78
11 Financial and insurance activities	4.46	4.59
12 Real estate	2.13	-0.12
13 Business activities	0.27	-6.27
14 Public administration and defense; compulsory social security	3.32	-0.89
15 Education	5.34	-1.34
16 Human health and social work activities	1.13	4.31
17 Other services activities	2.87	3.74
Total and Regional Economic Growth	100.00	-1.59

Source: BPS-Statistics Grobogan Regency, 2022



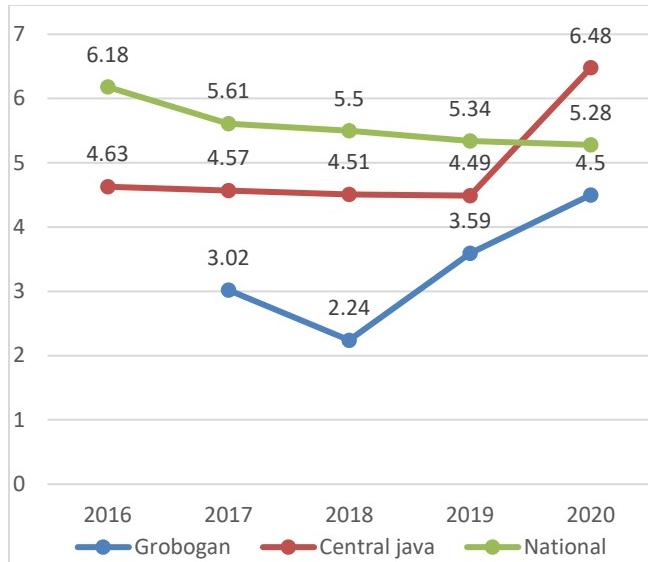


Figure 3. Open Unemployment Rate in Grobogan Regency in 2016-2020.

Farmer Welfare Using Market Performance: The tobacco growing area in Grobogan Regency has shown a very good trend of increasing planting realization and production over the last five years (from 2017 to 2021), with 70.48%. The sub-districts with a large tobacco growing area and with the largest increasing trend were Karangrayung Sub-district (228%), Pulokulon Sub-district (58.47%), and Tegowanu Sub-district (42.46%). The tobacco growing area in other sub-districts also experienced a significant increasing trend. It implies that each sub-district was trying to increase the planted area because price indicators continued to improve. This fact is in accordance and supported by the Cobweb Theorem law that farmers will increase the planting area when there is a previous price increase. In addition, farmers have to decide how much to produce a year in advance before knowing the market price in the tobacco market. A key determinant of supply or production will be the price from the previous year. A low price will mean some farmers go out of business. Also, a low price will discourage farmers from growing that crop next year. In fact, the demand for agricultural goods usually prices is inelastic.

Figure 4 explains that:

- If there is a very good harvest, supply will be greater than expected, and it will cause a fall in price.
- However, this fall in price may cause some farmers to go out of business. Next year farmers may be put off by the low price and produce something else. If there is one year of low prices, farmers will reduce the supply next year.
- If supply is reduced, it will cause the price to rise.
- If farmers see high prices (and high profits), they will be inclined to increase supply next year because that product is more profitable.

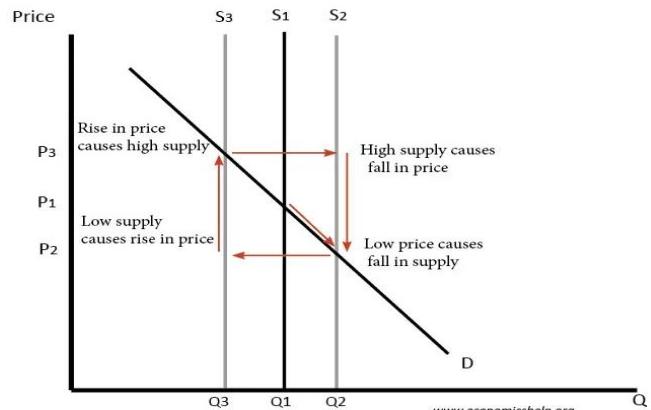


Figure 4. Cobweb Theorem

Based on FGDs with tobacco farmers, APTI (Indonesian Tobacco Farmers Association), and partner companies, it was confirmed that the operational costs from one planting season to post-harvest, including HOK and rent, amounted to IDR 36.5 million/ha. If the quality of tobacco products was not good, the price was around IDR 15,000-19,500/kg of dry tobacco, and if they produced 1.84-2 tons of dry, farmers could get IDR 56 million. It means that farmers still got profits in that range. If the tobacco yield was very good, farmers could get an average price of IDR 26,000/kg; thus, the farmer would get IDR 65 million/ha. Hence, it can be concluded that tobacco farmers never lose from their farming business because even at the lowest price, they still get a margin. If farmers feel a loss, it is more because of decreased profits.

Tobacco Industry Competitiveness: The analysis of the tobacco competitiveness based on the Porter's Diamond Theory revealed that:

a. **Factor condition element:** In this study, the factor condition was the availability of skilled labor from tobacco cultivation and processing to chopping and drying at farmers, traders, and collectors, which was quite adequate because the actors had experience in tobacco farming for many years (an average of 10 years or 3 to 4 generations). In addition, the infrastructure needed to support tobacco farming and trade in this region was also quite good in terms of quantity and quality, while the suitability of land resources with the type of tobacco plant was relatively high.

b. **Demand condition element:** Despite the erratic weather/climate, the demand for tobacco increased so that the supply in various main production centers (Temanggung Regency) decreased, which impacted the increasing demand for supporting production center areas, including in Grobogan Regency.

c. **Elements of market structure, competition, and tobacco farming strategy:**

The study results uncovered that the tobacco industry's market structure was oligopsony with several downstream industries and many upstream players, so prices tended to be stable and



depended on large industries. Here, buyers had the power to determine product prices. In oligopsony, there is the possibility of acquiring the number of products desired at the prevailing price without influencing the already established price. In this market, sellers (tobacco farmers) could not impose conditions on their goods or products. It supports the opinion that tobacco price changes between years are partly influenced by changes in weather/climate.

From the element of competition, tobacco commodities in Grobogan Regency had competitors from various regions, especially from Boyolali and Pacitan Regencies, each of which also supplied the needs of cigarette factories and chopped tobacco to Temanggung. However, the quality of Grobogan tobacco was not inferior to the tobacco produced in the two districts. Likewise, there is land competition with other crops such as rice because tobacco cultivation requires little water, especially at harvest; it is different from rice plants that require much water for cultivation.

As for the strategy element, some farmers collaborated with factories and, at the same time, carried out drying, chopping, and capitalization, although the role of middlemen was still large. For farmers with partnerships, the need for seeds, fertilizers, and other production facilities and marketing guarantees would be ensured, although price-fixing was often a problem in the future.

d. Elements of related and supporting industries: The results showed that as a downstream industry accommodating and processing tobacco products, the cigarette industry played a major role in supporting the development of tobacco farming in the Grobogan Regency. The companies comprised PT. Jarum Kudus, Gudang Garam Kediri, Sampurna Surabaya, and several smaller scale industries. Here, the absorption of tobacco farming products from Grobogan Regency by world-class cigarette businesses allows farming as an upstream industry to gain global competitiveness. In addition to the analysis of the four main elements of the Porter's Diamond Theory, the analysis results of the supporting elements disclosed:

Analysis of Government Policy Factors and Opportunities: The government's policy limiting cigarette advertising affects the certainty and sustainability of tobacco cultivation nationally. However, the contribution of excise is relatively large to the government's revenue in the tax sector for development financing. Until 2021, there has been a tendency to increase the area of tobacco land; this indicates that the various restrictions have not been effective in influencing the community not to become tobacco farmers. From the analysis of opportunity factors, the study results revealed that people's lifestyle toward a healthy life affected the demand for cigarettes, affecting the demand for tobacco. Here, cigarette consumers were still quite large, especially in domestic demand.

The government's policy factor regarding the contribution of cigarette excise and the opportunity factor provides an

opportunity for developing the cigarette and tobacco industry. Based on the analysis of the main and supporting elements, the analysis of the interrelationships between the components can be described, as presented in Figure 3.

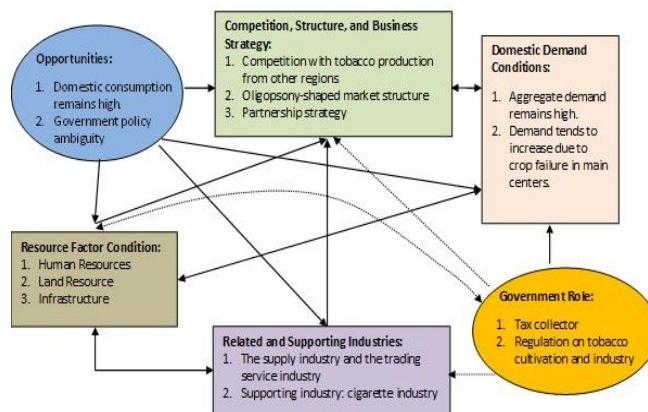


Figure 3. Relationships Between Components in the “Porter’s Diamond” Theory

Description: The line \longleftrightarrow shows the relationship between the components that support each other.

The line $\longleftrightarrow\cdots\cdots\cdots\rightarrow$ shows the relationship between the components that do not support each other.

From the analysis of the inter-component linkages presented in Figure 2, it can be concluded that the inter-relationships between the main components showed high competitiveness since the four main components have already supported each other. However, it is necessary to pay attention to the impact of government policies that do not support the trend of healthy lifestyles in the community. Therefore, it is recommended as follows:

- Further studies on the market and marketing of tobacco and competitiveness as a result of climate change are needed so that it can be a leverage for tobacco prices and farmers' welfare while strengthening the bargaining position of tobacco commodities, which will boost the socio-economic aspects of farmers and agricultural development in Grobogan Regency.
- In developing tobacco plants, the Grobogan Regency government should use two approaches: institutional strengthening for tobacco farmers and tobacco substitution and conducting an in-depth study of the tobacco trade system, competitiveness, and the welfare of tobacco farmers.
- To increase the competitiveness of tobacco, some strategies can be done, from external factors, market liberalization, and the decline in the domestic market (Lee & Eckhardt, 2017).
- The competitiveness of tobacco commodities in Grobogan Regency is also supported by the performance of the agricultural sector in this region as the leading



sector (See Table.3). As the leading sector, currently the agricultural sector acts as the base sector, and has the potential to remain the base sector in the future. As a leading sector, the agricultural sector has a $SLQ > 1$ and $DLQ > 1$ meaning that the level of specialization of the region is higher than the provincial level, and also has the potential to develop faster than the same sector in the province.

Table 3. SLQ and DLQ Over-lay on Economic Sector of Grobogan Regency in 2020

Criteria	DLQ > 1	DLQ < 1
SLQ > 1	Leading Sectors: 1. Agriculture, forestry, fishing 2. Wholesale and retail, car and motorcycle repair 3. Financial and Insurance Services 4. Transportation and storage	Prospective Sectors: 1. Real Estate 2. Education 3. Human Health and Social Work Activities 4. Other Services Activities 5. Public Administration and Defence; Compulsory Social Security 6. Accommodation and Food Service Activities
SLQ < 1	Mainstay Sectors: 1. Manufacturing 2. Electricity and Gas 3. Information and Communication 4. Water, processing of waste, waste and recycling 5. Construction	Less Developed Sectors: 1. Mining and quarrying 2. Business Services

Note: SLQ: Static Local Quotient; DLQ: Dynamic Local Quotient

This research is to define the comprehensive of tobacco farming in one location of Grobogan regency who has mostly produced tobacco leaves throughout the Porter's Diamond Theory. However, the implication for further impact of tobacco leaves for health impact in the same place has not been analyzed and needs to be assessed in future research.

Conclusion: The ability of tobacco farming to absorb labor in Grobogan Regency from planting to post-harvest was 150 HOK/ha to absorb 465,927 workers. The high absorption of labor in tobacco farming was due to the many stages of activities in tobacco farming, starting from seeding, land preparation, land processing, planting, maintenance, harvesting, and post-harvest. This absorption was much greater than corn farming (52 HOK/Ha) and rice farming (87 HOK/Ha). The tobacco farming and industry competitiveness based on an analysis of the "Porter's Diamond" components was currently high. However, it is necessary to pay close

attention to the impact of unsupported government policies and the trend of people's healthy lifestyles. Therefore, it is suggested (1) the need for further studies on the market and marketing of tobacco and its competitiveness because of climate change so that it can be a leverage for tobacco prices and farmers' welfare while strengthening the bargaining position of tobacco commodities, which will boost the socio-economic aspects of farmers and agricultural development in the Grobogan Regency. (2) In developing tobacco plants, the Grobogan Regency government should use two approaches: institutional strengthening for tobacco farmers and tobacco substitution and an in-depth study of the tobacco trading system, competitiveness, and welfare of tobacco farmers. (3) It is necessary to prepare tobacco farmers to change the profession of tobacco farmers when tobacco farming reaches a "trade-off" as an impact to anticipate changes in tobacco plant regulations. The tobacco growing area in other sub-districts also experienced a significant increasing trend. It implies that each sub-district was trying to increase the planted area because price indicators continued to improve. This fact is in accordance with the Cobweb Theorem law that farmers will increase the planting area when there is a previous price increase.

The potential for tobacco production for excise revenue sharing was quite large to support increasing regional fiscal capacity. This sharing fund will continue every year, so tobacco production must be increased by adding the area for growing tobacco or increasing tobacco productivity. In agriculture, tobacco leaves could be processed in several industries. To reduce the health impacts from tobacco products on cigarettes, tobacco leaves could be processed in other products for cosmetic purposes. Overall, the analysis confirmed that the potential of the tobacco industry in Grobogan Regency was economically very good and supported the KIHT development.

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